

- 12.1" display with LED backlight
- 1024 x 768 pixels resolution
- Intel Atom E3900 series
- All external interfaces on M12 connectors
- -25 °C to +70 °C (+85 °C), fanless
- Maintenance-free design
- Compliant to IP65 (front) and EN 50155 (railway)
- Linux and Windows support

ROBUST PANEL PC FOR INTERACTIVE RAIL APPLICATIONS

The DC20 panel PC is a rugged, fanless and maintenance-free human-machine interface (HMI) for railway applications. It features a 12.1" display and touch screen. Its small, ultra-flat mechanical design and configuration options save space in the driver cabin and allow the panel to be tailored for all types of applications in different train models. In addition, its full software compatibility with the 10.4" DC19 panel PC both increases flexibility and lowers costs, e.g., if a downgrade to a smaller panel is necessary.

HIGH-QUALITY, HIGH-RESOLUTION DISPLAY

The DC20 houses a robust impact-resistant XGA TFT LCD display with LED backlight. It also features LEDs and a light sensor at the front. Due to its high resolution and optimized usability, it is a perfect choice for, e.g., CCTV.

POWERFUL & ENERGY-EFFICIENT COMPUTING

The DC20 is powered by an Intel Atom processor from the E3900 series running at up to 1.6 GHz and equipped with up to 8 GB RAM with ECC and a 32 GB soldered eMMC. Standard interfaces include two Gigabit Ethernet, one CAN, one audio, digital I/O and RS232/RS422/RS485 - all available on M12 connectors at the back of the panel PC.

Two PCI Express Mini Card interfaces can control wireless communication functions like 4G LTE and GNSS. Two micro-SIM card slots with dual-SIM functionality are accessible at the back of the panel.



FLEXIBLE RAIL NETWORK CONNECTION OPTIONS

The DC20 can provide Multifunction Vehicle Bus (MVB) master or slave support where necessary, by adding an MVB PCI Express Mini Card. This makes the display scalable for different applications.

EXTREMELY RUGGED, PERFECTLY RAIL-READY

The DC20 comes with an extremely rugged housing with an IP65 compliant front. It supports a railway-compliant power supply of 24 V DC to 110 V DC, its internal PSU complying with EN 50155 class S2. Also in compliance with the standard, the DC20 operates in a -25 °C to +70 °C environment (+85 °C for 10 minutes), achieved through fanless conduction-cooling technology.

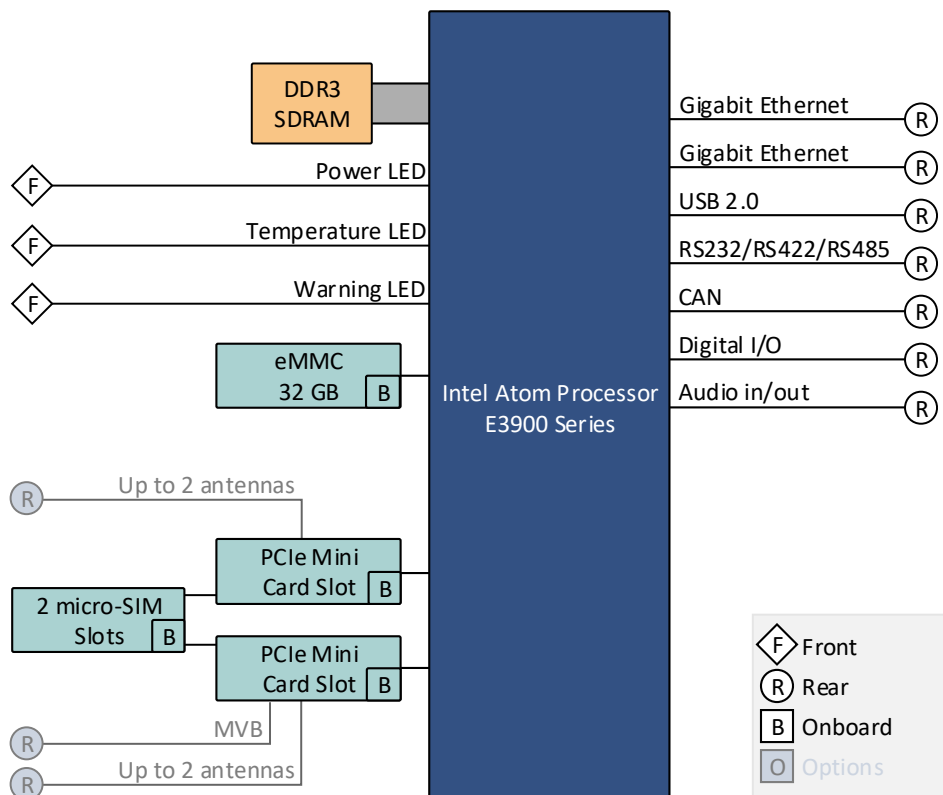
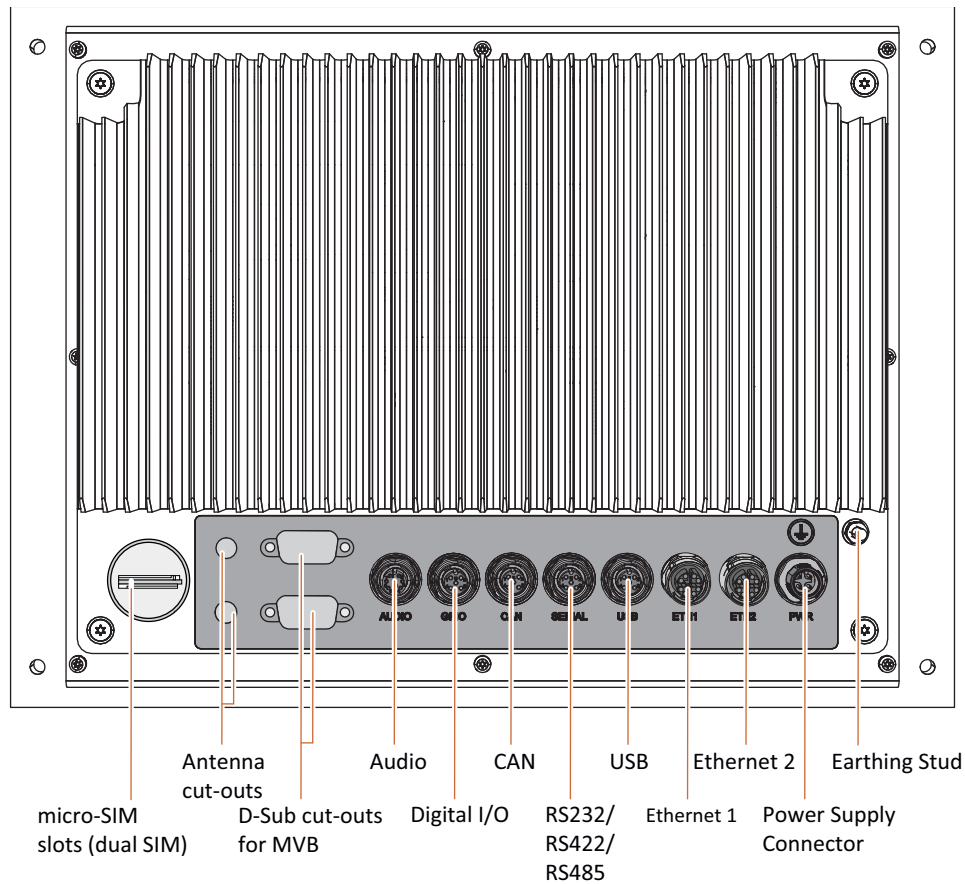
All electronic components are soldered to withstand shock and vibration, backed up by solid M12 connectors, and protected by conformal coating. Long-term availability ensures an extended product life and future-safety. The panel PC meets all important requirements for railway equipment for fast, competitive time-to-market even in mission-critical environments.



www.duagon.com/products/dc20/

DATA SHEET

DC20 | DIAGRAM





DC20 | TECHNICAL DATA

CPU

- The following CPU types are supported:
 - Intel Atom x5-E3930, 2 cores, 2 threads, 1.3 GHz, 1.8 GHz Turbo Boost, 6.5 W, 2 MB cache
 - Intel Atom x5-E3940, 4 cores, 4 threads, 1.6 GHz, 1.8 GHz Turbo Boost, 9.5 W, 2 MB cache
 - Intel Atom x7-E3950, 4 cores, 4 threads, 1.6 GHz, 2.0 GHz Turbo Boost, 12 W, 2 MB cache

DISPLAY

- Size/Resolution: 12.1" (4:3) / 1024 × 768
- Color depth: 16.2 M
- Luminance: 350 cd/m²
- Viewing angle: 80° / 80° / 80° / 80°

MEMORY

- System RAM
 - Soldered DDR3, ECC
 - 8 GB max.

MASS STORAGE

- eMMC (soldered); 32 GB

WIRELESS FUNCTIONALITY

- Possible functions:
 - GNSS
 - LTE
 - WLAN

INTERFACES

- This product includes interface options
 - Variable I/O in cutouts
- Touch screen
 - Touch technology: PCAP
 - Touch mode: Multi-touch (2 points)
- Light sensor
 - Light sensor position: top left

- Audio
 - 1 × M12, A-coded, receptacle
 - Stereo line input, single-ended
 - Stereo line output, differential
- USB
 - 1 × USB 2.0, M12, A-coded, receptacle, for service
- Ethernet
 - 2 × 10/100/1000BASE-T, M12, X-coded, receptacle
- PCI Express Mini Card
 - 2 × PCI Express Mini Card slot
 - Slot 1: PCIe Full-Mini; PCIe x1, USB 2.0
 - Slot 2: PCIe Full-Mini; PCIe x1, USB 2.0
- SIM card
 - 2 × micro-SIM slot, externally accessible
- Digital I/O
 - 2 × digital input, isolated, M12, B-coded, receptacle
 - 2 × digital output, isolated, M12, B-coded, receptacle
- Serial
 - 1 × RS232/RS422/RS485, isolated, M12, A-coded, receptacle
- CAN bus
 - 1 × CAN isolated, M12, A-coded, receptacle
- LED
 - User configurable: 1 ×
 - Status: power status, system status
- Cutout
 - Antenna connector options: QLS receptacle, RP-SMA receptacle, SMA receptacle
 - D-Sub options: MVB
- Power
 - 1 × power in, M12, A-coded, plug
- Earthing connection
 - M4 stud



SUPERVISION AND MANAGEMENT

- Temperature measurement
- Board management controller
- Real-time clock, buffered by supercapacitor (3 days)
- Trusted Platform Module 2.0

ELECTRICAL SPECIFICATIONS

- Supply voltage: 24 V DC to 110 V DC nom. (EN 50155)
- Power consumption: 30 W max.

MECHANICAL SPECIFICATIONS

- Dimensions: (W) 350 mm, (D) 260 mm, (H) 90 mm ;
Cutout: (W) 305 mm, (D) 243 mm
- Weight: 4.8 kg max.
- Cooling: Air cooling, natural convection, airflow 0.4 m/s
- Protection rating: IP65 (front), IP20 (back and sides)

PRODUCT COMPLIANCE: RAIL - ROLLING STOCK

- Operating temperature: -25 °C to +70 °C, +85 °C for 10 min (EN 50155:2017, class OT3, ST1)
- Rapid temperature variations: EN 50155:2017, class H1, no requirements
- Storage temperature: -40 °C (EN 50155:2017) to +85 °C (EN 60068-2-2, Bb)
- Altitude: +3000 m max. (EN 50125-1:2014, class AX)
- Pollution degree: EN 50124-1:2017, class PD2
- Humidity: +55 °C and +25 °C, 100 % RH max. (EN 50155:2017)
- Shock: 30 ms @ 50 m/s² (EN 61373:2010/AC:2017-09, vehicle body, cat. 1, class B)
- Vibration: 10 min @ 2.02 m/s² (functional) and 5 h @ 11.44 m/s² (long-life) (EN 61373:2010/AC:2017-09, vehicle body, cat. 1, class B, double acceleration)
- Power supply: Interruption of voltage supply: 10 ms (EN 50155:2017, class S2)
- Electrical safety
 - EN 50124-1:2017
 - EN 50153:2014 + A1:2017
 - EN 50155:2017
 - EN ISO 13732-1:2008
- Fire protection: EN 45545-2:2013 + A1:2015, HL3

- EMC emission
 - EN 50121-3-2:2016 + A1:2019
 - Regelung Nr. EMV 06 :2014-07-29, Anhang E: Messung an Geräten
 - Regelwerk 50.02.01 :2016-12-01, 12.3.1. EMV - Funk
- EMC immunity: EN 50121-3-2:2016 + A1:2019
- Protective coatings
 - EN 50155:2017, class PCX (As agreed between user and supplier)
 - coated: CPU board and IO board coated, both sides not coated: Display Board AF26, display and display electronics / backlight, touch, third party components e.g. LTE, WLAN, ...
- Useful life: 5 years (EN 50155:2017, class L1)
- Display compliance: UIC 612-01

RELIABILITY

- MTBF: 50 000 h predicted @ 40 °C according to IEC/TR 62380 (RDF 2000)

BIOS/BOOT LOADER

- AMI Aptio UEFI Firmware

SOFTWARE SUPPORT

- Linux
- Windows
 - Windows 10 IoT Enterprise 64-bit
 - Not all functions are supported
- Further Resources
 - See the product User Manual for details on software support: www.duagon.com/products/dc20/#doc
 - See section Software on the product web page for available packages: www.duagon.com/products/dc20/#downl
 - See also Application Note *Recommendations for a Robust Software Setup*



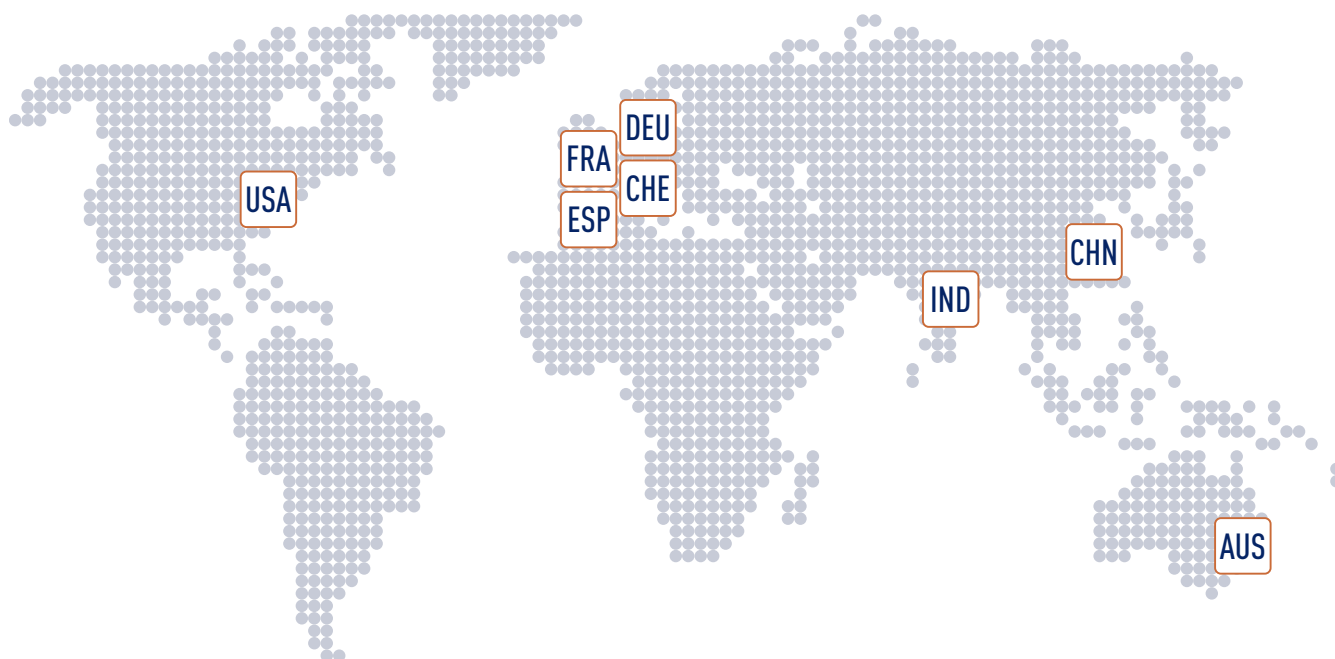
DC20 | ORDERING INFORMATION

STANDARD MODELS

09DC20-00 Panel PC, 12.1" touch display, Intel Atom x5-E3930, 1.3 GHz, 4 GB RAM, 24 V DC to 110 V DC, no interface options assembled, conformal coating



LEADING THE EMBEDDED FUTURE



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